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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/555,041	10/27/2005	Kiyoshi Yamaguchi	2271/75406	2755
23432 7590 05/31/2007 COOPER & DUNHAM, LLP 1185 AVENUE OF THE AMERICAS NEW YORK, NY 10036			EXAMINER AL HASHIMI, SARAH	
			ART UNIT 2853	PAPER NUMBER
			MAIL DATE 05/31/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/555,041

Applicant(s)

YAMAGUCHI ET AL.

Examiner

Sarah Al-Hashimi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/27/2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

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DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 10/27/2005 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1-4,11-12** are rejected under 35 U.S.C. 102(b) as being anticipated by Tetsuro (JP 2003-309302).

Tetsuro teaches:

Claim 1: a nozzle configured to discharge a liquid drop by using a piezoelectric element (para 50 “the nozzle plate” and para 1 “invention relates to the piezoelectric film mold”); wherein lead ingredients are not included in the piezoelectric element (para 13 “barium titanate system”).

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Claim 2: main ingredients of the piezoelectric element are materials having a perovskite type crystal structure not including lead (para 13 "barium titanate system"- perovskite type crystal).

Claim 3: main ingredients of the piezoelectric element are barium titanate (para 13 "barium titanate system").

Claim 4: main ingredients of the piezoelectric element are potassium niobate (para 55 "the niobic acid potassium prismatic crystal").

Claim 11: a liquid drop discharge head configured to discharge a liquid drop (para 50 "the nozzle plate"); wherein the liquid drop discharge head includes a nozzle configured to discharge the liquid drop by using a piezoelectric element (para 50 "the nozzle plate" and para 1 "invention relates to the piezoelectric film mold"), and lead ingredients are not included in the piezoelectric element (para 13 "barium titanate system").

Claim 12: a liquid drop discharge head configured to discharge the liquid drop (para 50 "the nozzle plate"); wherein the liquid drop discharge head includes a nozzle configured to discharge the liquid drop by using a piezoelectric element (para 50 "the nozzle plate" and para 1 "invention relates to the piezoelectric film mold"), and lead ingredients are not included in the piezoelectric element (para 13 "barium titanate system").

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Tetsuro (JP 2003-309302) in view of Masaki (JP 2001-151566).

Tetsuro does not teach but Maskai teaches:

Claim 5: main ingredients of the piezoelectric element are bismuth sodium titanate (abs "piezoelectric ceramic contains three components of bismuth sodium titanate").

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Tetsuro to incorporate main ingredients of the piezoelectric element are bismuth sodium titanate as taught by Masaki because actuators using bismuth sodium titanate are well known for superior quality in manufacturing.

7. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Tetsuro (JP 2003-309302) in view of Kenji (JP 2002-265262).

Tetsuro does not teach but Kenji teaches:

Claim 6: main ingredients of the piezoelectric element are nickel sodium titanate (para 14 "the nickel titanic-acid bismuth are included, and they may be dissolving and do not need to be dissolving completely. Moreover, the titanic-acid sodium bismuth may be included further").

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Tetsuro to incorporate main ingredients of the piezoelectric element are nickel sodium titanate as taught by Kenji because actuators using nickel sodium titanate are well known for superior quality in manufacturing.

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8. **Claims 7-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tetsuro (JP 2003-309302) in view of Masahiko (JP 10-297969).

Tetsuro does not teach but Masahiko teaches:

Claim 7: main ingredients of the piezoelectric element are materials having a tungsten bronze type crystal structure (para 2 “a piezoelectric material interesting for this invention, for example, $\text{Ba}_2\text{NaNb}_5\text{O}_{15}$ and $\text{Sr}_2\text{NaNb}_5\text{O}_{15}$ grade have a piezoelectric property and the electro-optical effect, and inquires widely using those single crystals”).

Claim 8: main ingredients of the piezoelectric element are

$\text{Ba}_{2.0}\text{NaNb}_{5.0}\text{O}_{15}$ (para 2 “a piezoelectric material interesting for this invention, for example, $\text{Ba}_2\text{NaNb}_5\text{O}_{15}$ and $\text{Sr}_2\text{NaNb}_5\text{O}_{15}$ grade have a piezoelectric property and the electro-optical effect, and inquires widely using those single crystals”).

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Tetsuro to incorporate main ingredients of the piezoelectric element are $\text{Ba}_{2.0}\text{NaNb}_{5.0}\text{O}_{15}$ as taught by Masahiko because actuators using $\text{Ba}_{2.0}\text{NaNb}_{5.0}\text{O}_{15}$ are well known for superior quality in manufacturing.

9. **Claims 9,10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tetsuro (JP 2003-309302) in view of Masamitsu (JP 2000-154054).

Tetsuro does not teach but Masamitsu teaches:

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Claim 9: main ingredients of the piezoelectric element are materials having a bismuth layered compound (abs "providing a composition represented by the formula $(1-x)\text{Bi}_4\text{Ti}_3\text{O}_{12} \cdot x\text{ReMnO}_3$ ").

Claim 10: main ingredients of the piezoelectric element are $\text{Bi}_{.4}\text{Ti}_{.3}\text{O}_{.12}$ (abs "providing a composition represented by the formula $(1-x)\text{Bi}_4\text{Ti}_3\text{O}_{12} \cdot x\text{ReMnO}_3$ ").

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Tetsuro to incorporate main ingredients of the piezoelectric element are $\text{Bi}_{.4}\text{Ti}_{.3}\text{O}_{.12}$ as taught by Masamitsu because actuators using $\text{Bi}_{.4}\text{Ti}_{.3}\text{O}_{.12}$ are well known for superior quality in manufacturing.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah Al-Hashimi whose telephone number is 571 272 7159. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on 571 272 2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SA



STEPHEN MEIER
SUPERVISORY PATENT EXAMINER